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taneous nor reflective cooperation. Not only must there be an agreement of thought, but for most, if not for all, public cooperation there must be a vast mass of sympathies and agreeing emotions. Men must have like sensations, be similarly sensitive to suggestion from resembling fellows, and enter subtly into like judgments without always being fully conscious of the process by which their conclusions are reached. The greater part of all public action must be described as a consequence of sympathetic and half-reflective agreement in plans and purposes, rather than as a consequence of systematic deliberation Moreover, it must not be forgotten that all public policy is a means to an end, proximate or ultimate; and that the ultimate end in every case is the maintenance and development of a certain type of man. That type itself is a mode of resemblance; and the recognition of it, which directs and controls all policies, is a mode of the consciousness of kind.

FRANKLIN H. GIDDINGS.

ATOMIC WEIGHTS.

THE following table of values is recommended for general adoption in analytical practice by a commission appointed by the German Chemical Society consisting of H. Landolt, W. Ostwald and K. Seubert. (Ber. d. D. Chem. Ges. *1898*, 31, 2761.)

The commission recommends that:

1. The atomic weight of oxygen be taken as 16.000, and that the atomic weights of the other elements be calculated on the basis of their combining ratios with oxygen, directly or indirectly determined.

2. The following atomic weights of the elements be adopted in practice, as they are probably the most correct values known at the present time.

These numbers are, as a rule, given only with so many decimals that even the last one may be regarded as accurate. In consequence, the atomic weights determined by Stas, in which the errors amount to from 3 to 6 units in the third decimal, are given with two decimals; the other atomic weights which have been more accurately determined are given with one decimal, and those less accurately determined are given without decimals. Exceptions to this rule have been made only in the cases of nickel, bismuth and tin, marked with an asterisk in the table.

Name.	Symbol.	Atomic Weight.	Name.	Symbol.	Atomic Weight.	Name.	Symbol.	Atomic Weight.
Aluminium	Al	27.1	Helium (?)	He	4.	Rubidium	Rb	85.4
Antimony	Sb	120.	Hydrogen	H	1.01	Ruthenium	Ru	101.7
Argon (?)	A	40.	Indium	In	114.	Samarium (?)	Sa	150.
Arsenic	As	75.	Iodine	I	126.85	Scandium	Sc	44.1
Barium	Ba	137.4	Iridium	Ir	193.0	Selenium	Se	79.1
Bismuth	Bi	208.5*	Iron	Fe	56.0	Silicon	Si	28.4
Boron	B	11.	Lanthanum	La	138.	Silver	Ag	107.93
Bromine	Br	79.96	Lead	Pb	206.9	Sodium	Na	23.05
Cadmium	Cd	112.	Lithium	Li	7.03	Strontium	Sr	87.6
Cæsium	Cs	133.	Magnesium	Mg	24.36	Sulphur	S	32.06
Calcium	Ca	40.	Manganese	Mn	55.0	Tantalum	Ta	183.
Carbon	C	12.00	Mercury	Hg	200.3	Tellurium	Te	127.
Cerium	Ce	140.	Molybdenum	Mo	96.0	Thallium	Tl	204.1
Chlorine	Cl	35.45	Neodymium (?)	Nd	144.	Thorium	Th	232.
Chromium	Cr	52.1	Nickel	Ni	58.7*	Tin	Sn	118.5*
Cobalt	Co	59.	Nitrogen	N	14.04	Titannium	Ti	48.1
Columbium	Cb	94.	Osmium	Os	191.	Tungsten	W	184.
Copper	Cu	63.6	Oxygen	O	16.00	Uranium	U	239.5
Erbium (?)	Er	166.	Palladium	Pd	106.	Vanadinum	V	51.2
Fluorine	F	19.	Phosphorus	P	31.0	Ytterbium	Yb	173.
Gallium	Ga	70.	Platinum	Pt	194.8	Yttrium	Y	89.
Germanium	Ge	72.	Potassium	K	39.15	Zinc	Zn	65.4
Glucinum	Gl	9.1	Præsodymium (?)	Pr	140.	Zirconium	Zr	90.6
Gold	Au	197.2	Rhodium	Rh	103.0			

In the case of nickel this was done in order to emphasize the difference between the atomic weights of cobalt and nickel, although in both values there may be possible deviations of ± 0.2. The true atomic weights of bismuth and tin are not correct to a certainty, to within 0.1. The value of hydrogen is 1.008, correct to within 0.001, but the approximation of 1.01 has been regarded as permissible for the requirements of practice, as it involves an error of only one-fifth of one per cent. The values given for the elements marked in the table with interrogation points are not necessarily exact within whole units of the atomic weights assigned.

Ferdinand G. Wiechmann.

JOHN CUMMINGS.

In the decease of Hon. John Cummings, of Woburn, Mass., on the 21st of December, there terminated a life which has been noteworthy for the encouragement it has given to the study and teaching of science. In the early part of his manhood days Mr. Cummings acquired a reputation for honorable dealing and for his success in the manufacture of leather in his native town of Woburn. To that town he was always loyal and generous, but his intelligence and his activity led him into larger circles until he became favorably known and his influence was felt in a large and populous community. He became acquainted with the late William B. Rogers, for whom he always cherished an admiration and a profound regard. He also knew Louis Agassiz, Jeffries Wyman, Asa Gray and others, and he soon became a student as well as a lover of nature. The offices of trust and of business responsibility which he filled make a long and notable list, but his large affairs did not prevent him from cultivatiug a love for science, and they aided him in multiplying his gifts to the cause of education. Through his attachment for William B. Rogers he was interested in the founding of the Massachusetts Institute of Technology, and he became one of its most substantial supporters, contributing to its financial needs and serving as its Treasurer for 17 years. It was through his generosity that the Boston Society of Natural History started its 'Teachers' School of Science,' and it was through his liberality that its botanical collection was developed and that it has received special care to the present day. He was actively and generously interested in the work of public instruction, and he extended his aid to the South after the close of the Civil War. In one instance he purchased a building and supplied teachers, urging them to work for the establishment of free public schools, and when this was about to be accomplished he donated the building to the cause. His gifts and his efforts were never calculated to attract attention to himself, and many of his good deeds were scarcely known even by his friends. He was one of a class of honorable and broad-minded business men who have been magnanimous in their support of science education, and who have found time to participate in the acquisition of knowledge, while aiding others to means for the prosecution of their studies or investigations.

Wm. H. Niles.

SCIENTIFIC BOOKS.

Matter, Energy, Force and Work. By Silas W. Holman, Professor (Emeritus) Massachusetts Institute of Technology. New York, The Macmillan Company.

Lovers of exact science are already indebted to Professor Holman for numerous important contributions to our knowledge of physics and especially for valuable suggestions as to the best treatment of the experimental solution of physical problems. His most pretentious work thus far is that on 'Precision of Measurements,' which is everywhere recognized as a standard and which ought to be in the hands of every